

Enhancing Road Safety Knowledge in School Children Through Video Assisted Learning: A Pretest Posttest Study

Renu Sharma

MSc Community Health Nursing, College of Nursing AFMC Pune

Abstract: ***Introduction:** Road Traffic accidents are one of the primary problems impacting public health worldwide, WHO stated that road traffic injuries are the top cause of mortality for children and young people aged 5 to 29. As per the WHO Global Report on Road Safety 2018, India accounts for almost 11% of the accidents related deaths in the World. The United Nations General Assembly declared 2011-2020 as Decade of Action for Road safety. **Materials and methods:** One group pretest posttest research design was used to assess the effectiveness of video assisted learning programme regarding knowledge on road safety measures among school children. 190 samples were recruited through stratified proportionate random sampling. A self-structured questionnaire was used after testing validity and reliability of the tool. The data was analyzed by descriptive and inferential statistics. **Results:** Among the 190 participants majority of the study participants (57.37%) had good knowledge score in pretest and 35.26% had excellent knowledge score whereas in posttest 162 subjects i.e. 85.26% had excellent knowledge score and 28 (14.74%) had good knowledge. The mean value of pretest knowledge score was 14.25, posttest knowledge score of the study group was 17.81. The computed Wilcoxon sign test value of 10.63 found to be statistically significant at the level of significance of <0.0001 . **Conclusion:** The findings concluded after receiving an efficient educational intervention in the form of video-assisted learning, schoolchildren's knowledge levels increased. Children's pre-test knowledge levels had a significant association with their gender, mother's education level, and mode of transportation.*

Keywords: Assess, Effectiveness, Knowledge, Video-assisted learning programme, Road safety measures & school children

1. Introduction

In today's world road and transport has become an integral part of every human being. Everybody is a road user in one way or the other. (1) In India nowadays, roads are the main mode of transportation. In addition to the dreadful COVID-19 epidemic, which is currently gripping the whole world, it is crucial to take into account another health disaster that has been slowly escalating for decades (2). Every year the lives of approximately 1.3 million people are cut short as a result of a road traffic crash. Between 20 and 50 million more people suffer non-fatal injuries, with many incurring a disability as a result of their injury. (3)

Since today's children are tomorrow's citizens and healthy children are a nation's resources. Children are not only a large population, but also a vulnerable or "special risk group" as a result of insufficient health care, nutrition, immunization, knowledge and other factors. Moreover, 11 to 14 years is an early adolescent era in which the child is in industry vs inferiority, and physical, mental, emotional, and social transformations are more prevalent. There is a significant gap in school children's awareness of road safety measures.

It is our responsibility as parents, teachers, and caregivers to educate our children about real-world traffic settings while providing adult supervision to assist them learn about roads, signals, traffic, hazards involved, and how to utilize the roads safely.

Despite years of regulation aimed at improving road safety, India remains one of the worst-performing countries, with 1,47,913 persons killed in traffic accidents in 2017, according to data from the Ministry of Road Transport and

Highways. In the same year, the National Crime Records Bureau (NCRB) recorded 1,50,093 road deaths. Furthermore, according to the Global Burden of Disease research for 2017, there were 2,18,876 deaths based on verbal autopsy sources, albeit India's data on road crash mortality are considered an undercount. The nation's ability to fulfil Sustainable Development Goal (SDG) 3.6, which aims to decrease the number of traffic fatalities and injuries in half by 2030, is put into doubt by the nation's consistently high yearly fatalities and injuries. (13)

While there has been a small decline in the number of deaths resulting from road crashes in the country--from 1,51,417 in 2018 to 1,51,113 in 2019 there has been an alarming increase in the number of children dying in such accidents. According to the report by the Ministry of Road Transport and Highways, 11,168 children lost their lives in road crashes in 2019, which is an increase of 11.94% over the previous year. (14)

Problem Statement

"A study to assess the effectiveness of video assisted learning programme on knowledge regarding road safety measures among school children of selected schools of urban community of Western Maharashtra."

Objectives

- To assess the existing level of knowledge on road safety measures among school children.
- To assess the post-test level of knowledge on road safety measures after video assisted learning program among school children.
- To determine the effectiveness of video assisted learning programme on Road Safety among school children.
- To find the association between Pre - test knowledge of

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road safety measures and the selected demographic variables among school children.

Hypothesis

H1 (a): There is no significant difference between pre-test and post-test knowledge scores regarding road safety measures among school children.

H1(b): There is no significant association between the pretest knowledge score regarding road safety measures with their selected demographic variables among school children.

Research approach

A Quantitative approach was adopted considering it as the most appropriate approach.

Research design

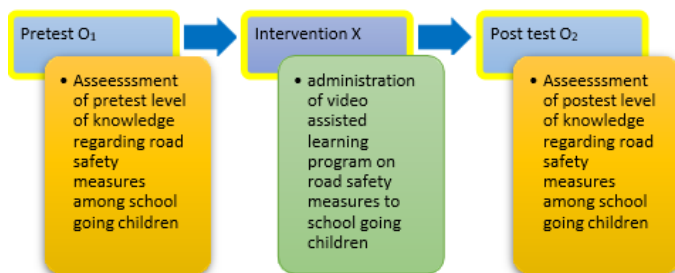


Figure 1: Schematic diagram of one group pre- test post-test research design

Variables

- **Independent variable:** Video assisted learning program on Road safety measures.
- **Dependent variable:** School student’s knowledge on road safety measures.
- **Setting of the study:** Kendriya Vidyalaya School of the urban community of Western Maharashtra.

Study population

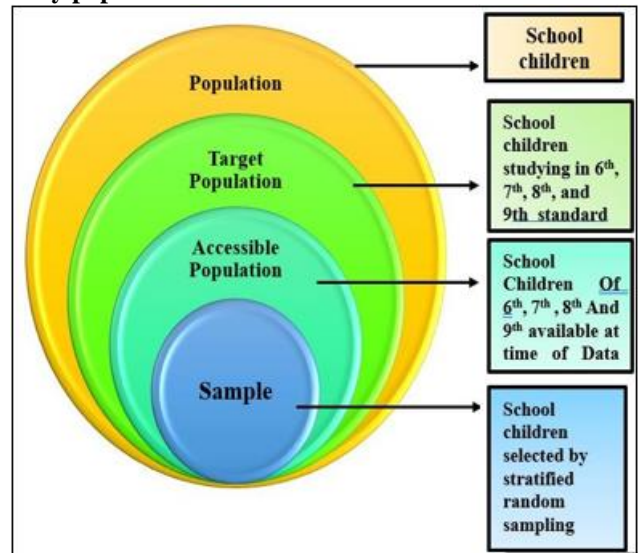


Figure 2: Schematic representation of selection of study sample

The sample size is calculated as per formula given below and based on knowledge score obtained in the study conducted by Usha Chakali.(47)

$$N = (z\alpha + z\beta)^2 p q / E^2$$

Where, N

is the desired sample size

zα set at 1.96 corresponding to 95% confidence interval (CI)
 zβ set at 0.84 corresponding to 80% power of the study.
 p, the proportion of variable under study obtained from previous study
 q is the proportion 100-p; (100-96 =04) E, Absolute precision is set at 4% Hence, $N = (z\alpha + z\beta)^2 p q / E^2 = (1.96+ 0.84)^2 96*4 /16 = 188$

Hence it was concluded that a sample of 190 will be inducted for the study.

2. Conceptual Framework

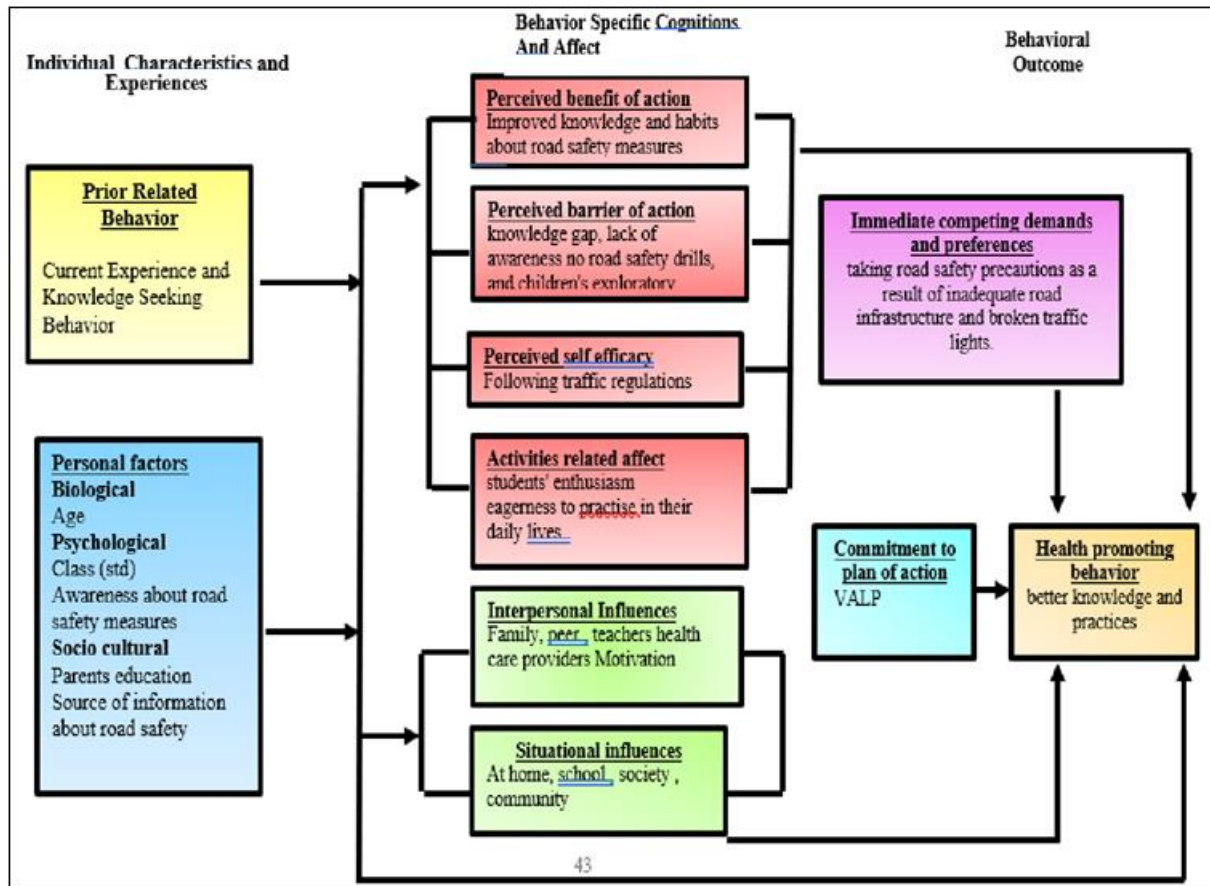


Figure 3: Conceptual framework based on Pender Health promotion model

Sampling technique

Stratified disproportionate random sampling was used.

Sampling criteria Inclusion Criteria

School children were selected based on the following inclusion criteria:

- School children who were
- Studying in class VI to IX.

Exclusion criteria

School children who were

- Absent on the day of data collection period.
- Sick, Mentally and physically challenged students
- Unwilling to participate

Tool

Section & Part	Content	No of items	Scoring
Section A	Socio Demographic data	7	Age, Gender, Class of study, Father's education, Mother's education, Previous knowledge about road safety measures, Mode of transportation to School
Section B	Knowledge questionnaire	10	This questionnaire has covered all the important areas of road safety measures.

Validity

Section A and B is validated by 9 experts from department of Community nursing specialty along with epidemiologist,

biostatistician and traffic police department.

Reliability

The reliability of the tool was calculated after carrying out the pilot study on 19 school children in selected school. The reliability was tested with Cronbach Alpha reliability test formula. Cronbach's alpha was calculated to be 0.89 for the tool and it was revealed that the tool exhibited outstanding internal consistency.

Data Collection Process

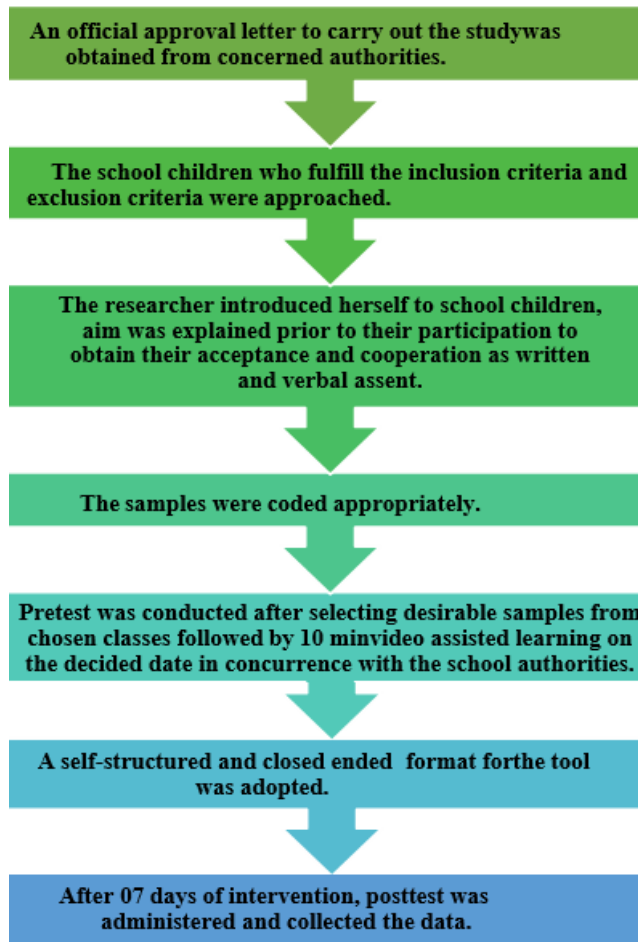


Figure 4: Data Collection Process

Plan for data analysis

- Utilized MS Excel to arrange data on a master sheet
- Calculated data for the sociodemographic profile using percentages and frequencies
- The effectiveness of a video-assisted learning programme was evaluated using knowledge scores from

- a pre- and post-test.
- Tested hypotheses with the ANNOVA Man Whitney Wilcoxon test
- The outcomes were shown in tables and graphs.

3. Analysis and Interpretation

Analysis and interpretation of the data is the most important phase of research process, which involves the computation of the certain measures along with searching for patterns of relationships that exist among data groups .

Organization of data

The data was collected, tabulated, analyzed, interpreted and the results obtained were organized in the following three sections.

- Section I: Description of socio demographic variables
- Section II: Analysis of data related to pretest and posttest knowledge score
- Section III: Analysis of effectiveness of video assisted learning programme
- Section IV: Association of selected demographic variables with pretest knowledge score

4. Results

Mean, frequency, and percentage distribution were used as descriptive statistical measures to compute the socio-demographic variables, while Mann Whitney test, Wilcoxon test, and ANOVA were used as inferential statistical measures to evaluate the data.

Association of pre test knowledge score with the demographic variables was computed using statistical measure of Mann Whitney Z test and ANOVA test.

Table 1: Frequency distribution of study participants as per Socio demographic variables n = 190

	Parameter	No of cases	Percentage
Age (Yrs)	10 – 11	30	15.8
	12 – 13	99	52.1
	14 – 15	61	32.1
Gender	Male	98	51.6
	Female	92	48.4
Class of study	6 th	57	30
	7 th	45	24
	8 th	44	23
	9 th	44	23
Father education	Primary	6	3.2
	Secondary	31	16.3
	Higher secondary	42	22.1
	Graduate & above	111	58.4
Mother education	Primary	8	4.2
	Secondary	41	21.6
	Higher secondary	49	25.8
	Graduate & above	92	48.4
Prev knowledge about road safety measures	Yes	97	51.1
	No	93	48.9
Mode of transportation to school	Self by walk	20	10.5
	Self by bicycle	07	3.7
	Self by two wheeler	11	5.8
	School hired transport/ parent vehicle	152	80.0

According to age majority of study participants 99 (52.1%) belonged to the age group of 12-13 years whereas only 30 (15.8%) belonged to the age group of 10-11 years. 98 Samples (51.6%) were males and 92 (48.4%) were females. Each class included approximately the same amount of participants. 111(58.4%) fathers of school children were graduate and above whereas only 6(3.2%) had primary education. 92(48.4%) mothers were graduate and above and only 8(4.2%) had primary education. Out of 190 participants, 97 (or 1%) had prior awareness of road safety measures, as shown in table 4.1.c, whereas 93 (or 48.9%) had no prior knowledge of such measures. Parents were the primary information sources for the majority of school children, while 9 cited their school as the source of information. Only 7 (3.7% of the 152) rode bicycles to get to school, as opposed to 152 (80%) who utilized school-provided transportation or a parent's vehicle.

Table 2: Knowledge score wise distribution of school children in study group

K score	Pre test		Post test	
	No of cases	% age	No of cases	% age
6 –10 (Avg)	14	7.37	0	0
11 – 15 (Good)	109	57.4	28	14.74
16-20 (Excellent)	67	35.3	16	85.26

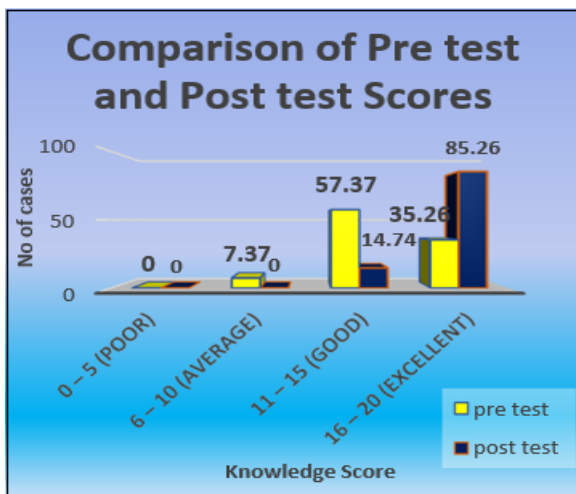


Figure 5: Bar diagram showing knowledge score of school children regarding road safety measures

This fig shows that out of 190 school children, majority of the subjects (57.37%) had good knowledge score in pretest and 35.26% had excellent knowledge score whereas in posttest 162 subjects i.e. 85.26% are having excellent knowledge score and 28 (14.74%) have good knowledge.

The knowledge scores of the subjects showed a marked increase as seen in post test score of the study group with 25 % of increase in knowledge, which indicates that video assisted learning programme was effective in increasing the knowledge of school children regarding road safety measures.

Table 3: Comparison of pre and post knowledge mean score in study group

Parameter	Pretest		Post test		Wilcoxon Z Value	P Value
	Mean	SD	Mean	SD		
Knowledge Score	14.25	2.35	17.81	1.84	10.63	<0.0001

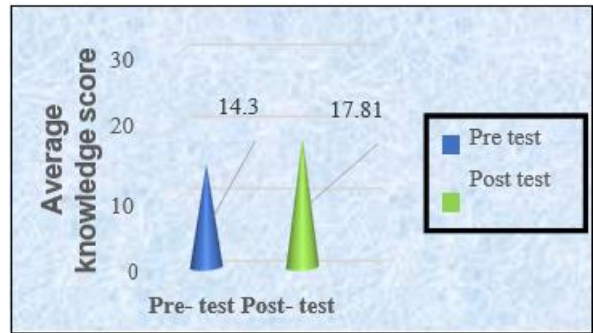


Figure 6: Comparison of pre test and post test knowledge mean score

Table 3 and fig.6 explains the comparison between pretest and posttest knowledge score in the study group. The findings of the table reveals that the mean value of pretest knowledge score was 14.25 ±2.35 and post test knowledge score of the study group was 17.81±1.84. since the computed wilcoxon sign test value

10.63 is more than table value of 1.96 in the study group, there is statistically significant increase in post test knowledge at the level of significance of <0.0001. Thus, video assisted learning programme proved to be highly effective in increasing the knowledge of subjects regarding road safety measures.

5. Discussion

(57.37%) had good knowledge score in pre test and 35.26% had excellent knowledge score whereas in post test 162 subjects i.e. 85.26% are having excellent knowledge score and 28 (14.74%) have good knowledge.

The knowledge scores of the subjects showed a marked increase as seen in post test score of the study group with 25 % of increase in knowledge, which indicates that video assisted learning programme was effective in increasing the knowledge of school children regarding road safety measures.

In same line with present study, a study conducted by **Uma Maheswari, Rajathi Sakthivel** reported that the pretest mean score of knowledge among the children was 10.94±6.16 and the post-test mean score was 24.54±2.75 hence The calculated paired Value of t value of t= 13.38 was found to be statistically significant at p<0.001 level, depicting that VATP had a significant impact on the knowledge on the road safety measures among the school age children. (24)

6. Implication to Nursing

Nursing Practice

- One approach of teaching in clinical nursing is the use of video-assisted instruction as to enhance learning.
- Through efficient teaching techniques that encourage individuals to live healthy lifestyles, nurses play a crucial part in disease prevention and health promotion education programmes.

Nursing Education

- Nursing educators may use the study's findings as a reference as they design and implement educational programmes for nursing students that cover transportation safety considerations.
- Health promotion and preventive practices should be made known to a variety of community groups as a focus of the student teaching experience.
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- Post-graduate nurses need to improve their ability to design health education materials that are appropriate for the community's understanding level.

Nursing Administration

- It aids nursing students in managing large groups and learning how to run public and community awareness campaigns.
- It aids the nurse in learning how to plan the programme and address problems should they emerge.
- It increases knowledge of programme planning and financial planning.
- The nurse administrator should be interested in educating the public and the community about health-related preventative measures for traffic accidents.
- The nurse should develop instructional programmes for nursing staff and inspire them to run public-beneficial road safety campaigns as an administrator. Such programmes involve effective teamwork, resource planning, and time management in order to carry out successful education programmes.

Research Implications for Nursing

- It gives nursing students inspiration for study on the efficacy of various road safety measures. In this field, considerable and thorough study is required in order to develop techniques for training nurses to reduce traffic accidents.

Nursing is a practice-based specialty, hence research is conducted to address problems that have an immediate impact on nursing practices. Nursing implications are the potential clinical repercussions or impacts of putting the study's conclusions into practice.

7. Summary of the Study

The present study was conducted with the aim to assess the effectiveness of VALPon knowledge regarding road safety measures and to make the aware of road safety so that they can practice in their day to day lives and protect themselves from such injuries and live a healthy life.

It was an experimental study with one group pretest- posttest research design with sample size of 190 school children studying in class 6th to 9th chosen by proportionate stratified random sampling. Samples who were meeting the inclusion criteria were taken from a selected school of urban community. Permission was taken from concerned authorities for the smooth conduct of the study.

The tool used for data collection was a structured self-administered Knowledge Questionnaire of 20 MCQ questions devised by the researcher and validated by various

experts from different fields. The video assisted learning programme was prepared by the researcher and content assessed for validity and reliability by group of experts. The pretest was conducted on day 1 for the group followed by video assisted learning and posttest was taken after 7 days. The researcher used J Pender health promotion model.

The pretest and posttest knowledge scores were calculated in order to assess the effectiveness of video assisted learning using descriptive and inferential statistics and results were compared with the similar literature to understand the findings.

8. Conclusion

In this study, after receiving an efficient educational intervention in the form of video-assisted learning, schoolchildren's knowledge levels increased. Children's pretest knowledge levels had a significant association with their gender, mother's education level, and method of transportation.

Children's preparation for independent travel is greatly aided by their parents and carers. Therefore, it was determined through this research that education was crucial in increasing schoolchildren's knowledge of road safety measures, and it is necessary to have practice lessons from traffic police and road safety cells in schools.

Since the video aided learning programme was a success with students, similar structured teaching programmes may be deployed in all schools.

- OSCE-based practice evaluation of school children can be done.
- Road traffic police lectures and demonstrations might be conducted in schools to educate students about many elements of road safety.
- Urban and rural locations might be compared in a research.

9. Limitation

The purpose of the current study was to evaluate knowledge by evaluating the effectiveness of a programme for video-assisted learning. Although it was discovered that educational intervention in the form of video was effective in improving the knowledge score of schoolchildren, the study had some drawbacks, including the following:

- Study was restricted to selected schools in urban communities, which further restricted the scope for comparison.
- The process of creating the videos required a lot of time.
- The researcher had little control over what happened between the pre- and post-test, and doing a large-scale study was difficult due to time and resource limitations.
- The study concentrated on evaluating students' knowledge, although practices might also be evaluated.

Acknowledgement

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10. Recommendations and Suggestion

- The study can be repeated in another environment to support the conclusions.
- A longitudinal study may use the post-test results after one month, six months, and a year to look at knowledge retention.
- Since the video aided learning programme was a success with students, similar structured teaching programmes may be deployed in all schools.
- OSCE-based practice evaluation of school children can be done.

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